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ETHNOLOGY.—*Animal names, anatomical terms, and some ethnozoology of the Flathead Indians.* GEORGE F. WEISEL,[1] Montana State University, Missoula, Mont. (Communicated by John C. Ewers.)

A number of dictionaries and word lists have been made of the Flathead tongue, but no effort in the nature of an ethnozoological list has been undertaken. Not being naturalists, those who have studied the Flathead and allied Salishan tribes were unable to obtain accurate European and scientific equivalents for the Indian names of animals. Also, many of the lesser known animals were overlooked.

The most complete inventories of the Flathead language are *Grammatica linguae Selicae* by P. Mengarini, S. J. (1861), and *A dictionary of Kalispel or Flat-Head language* compiled by J. Giorda, S. J. (1877–79). Both of these contain only the names of the more obvious animals, and they do not use modern linguistic description. There exist a number of short lists of Flathead terms gathered by early traders. Examples of these may be found in *The journals and letters of Major John Owen* (1927, pp. 319–325) and in *The journals of Alexander Henry and of David Thompson* (1897, pp. 714–718). The frontiersmen made no attempts at phonetic spelling, and, as they were primarily interested in trade, the animals listed were restricted to the fur bearers and the larger game species. There is some linguistic material in standard phonetic transcription in a paper by Turney-High (1937, pp. 150–160), but it is very limited and the animal terms are ill defined.

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By far the most exact work on the Flathead language was done by Hans Vogt. In his monograph *The Kalispel language* (1940, p. 7) he asserted that the Kalispel tongue is almost identical with the Flathead. However, his dictionary does not include many of the animal names listed in this paper, and some of his terms are identified merely as "kind of bird" or "a fish." Other terms are not given their precise English name. For instance, his "red-headed wood-pecker" is more exactly the western pileated woodpecker. Most of Hans Vogt's names coincide rather well with those taken from my informants. Some discrepancies may be due to differences in Flathead and Kalispel dialects.

The homeland of the Flathead tribe proper, at least in historic times, was just west of the Continental Divide in the Bitterroot Valley of Montana (Teit, 1930, p. 310; Turney-High, 1937, p. 12). The fauna in this area has remained less changed since the advent of white men than most. Big-game species, such as elk, deer, bear, and mountain goat, are hunted there today. Undoubtedly, if the accounts of early travelers through this country are to be acknowledged, most of the mammals have been depleted greatly, especially bighorn sheep and grizzly bear (Koch, 1941, pp. 357–369). The Flathead relied on these animals and on wild plants for their needs. There is no evidence that they had domesticated plants. They were a nomadic people, well supplied with horses, who supplemented their local sustenance with buffalo, which they hunted regularly on the plains east of the mountains (Rep. Comm. Ind. Affairs, 1857, pp. 663–669; Ewers, 1948, p. 14). These factors

make the Flathead admirably suited for ethnozoological study. As the original fauna is qualitatively intact, the informants do not have to rely on hearsay for the recognition of animals; and, as they once depended on hunting and fishing for food, they are keenly aware of the animals around them.

Several Flathead Indians were questioned on aspects of ethnozoology, but it was soon evident that they cast aside veracity in their efforts either to please or to "pull the leg" of the interrogator. The chief informant finally selected was Ellen Big Sam, a woman of 71 years at closest estimate. She is exceptionally bright, has always been a close observer and lover of animals, and is sincere in her answers. She was born in the Bitterroot Valley and married into the tribe. Although she has some Shoshonean ancestry, she is said to speak as pure Flathead as anyone on the Flathead Reservation. Since she does not speak English, her adopted son, Joe Big Sam Woodcock, acted as interpreter. He is an intelligent man who served several years with the army in the South Pacific. According to Joe, Ellen knows the Indian names of more animals than any other Flathead. He claims that members of his own generation are acquainted with but few of them and that his young boy learns to speak Flathead reluctantly. Evidently, the older Indians—the few who can recall the days when most of their living came from the hunt—are the only ones who know most of the terms. This generation has practically died out. Acculturation has proceeded so rapidly that in another five to ten years the information will no longer be available.

To associate the Indian names as accurately as possible with the various animals, the principal informant was taken to the Zoology Museum of the University of Montana where mounted or pickled specimens were laid before her. A previous attempt at using colored pictures proved a failure. Ellen is not conditioned to visualizing from a flat perspective. In some instances, when she could not recall the name of a bird or a fish, she was allowed to take the specimen for further consideration to Mrs. Jerome Vanderberg, another older woman encamped near the University gathering bitterroots. Ellen possesses an amazing knowledge of the local fauna and is undoubtedly accurate in her identifications. If she does not recognize an animal, or has forgotten its name, she admits it. To test her acumen, she was shown an eastern brook trout and a rainbow trout. Neither of these fish is native to the upper Columbia watershed, but they closely resemble the bull trout and the cut-throat trout, respectively, which are indigenous. She immediately spotted these two species as ones introduced into the country by white men.

For anatomical terms, a dissected cat and an articulated human skeleton were used. Although it was realized that older Indians had dressed out many mammals, it was still a surprise to find how well the viscera are known and the detail in which they are classified. For example, the greater omentum is not lumped in one word with the other mesenteries but is given a separate name.

The means of hunting and the role different animals played in the subsistence of the Flathead have been fairly well covered by Teit (1930, pp. 341–349) and Turney-High (1937, pp. 111–129). No particular effort was made to gather more information on the subject. However, a number of miscellaneous and out-of-the-ordinary observations were collected.

The simplified form of phonetic symbols from *Phonetic transcription of Indian languages* (Smithsonian Misc. Coll., 1916) is used in this study. Admittedly, my limitations in the highly specialized training needed for Indian orthography do not impart the precision desired. However, it is believed that the words can be easily recognized and that they should be of use to ethnologists and linguists who wish more accurate animal identifications than were previously provided.

FISHES

The fish fauna of western Montana has been greatly altered in the past 50 years. Accounts by men who were in the territory in 1850–65 reveal that trout were amazingly abundant in the Clark Fork and Bitterroot Rivers (Dodson, 1852, original MS.; Stewart, 1925, p. 186; McAdow, 1952, p. 45). But today it takes an expert fisherman and modern equipment to make much of a catch in these rivers. Pollution, irrigation, and overfish-

ing have taken their toll. Except for the introduction of rainbow trout (*Salmo gairdnerii*), brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*), the species that inhabit the rivers and creeks must be the same as ages ago. In the lakes many more exotic species have been added. These include lake trout (*Salvelinus namycush*), Great Lakes whitefish (*Coregonus clupeaformis*), black bullhead (*Ameiurus melas*), yellow perch (*Perca flavescens*), largemouth bass (*Micropterus salmoides*), and pumpkinseed (*Lepomis gibbosus*).

Although fish were extensively used for food by the Flathead, fishing contributed much less to their livelihood than hunting. There were no large runs of fish in their streams that could be relied on to furnish ample provender at certain times of the year. Their related tribes—the Pend d'Oreille, Kalispel, and Spokan—were much more dependent on fisheries.

The Flathead were well acquainted with the salmon, although it is not native to the waters of western Montana. There is a legend that Coyote attempted to bring them this fish, but, when part way up the west side of Lolo Pass, he became tired and dropped it, and it flopped back down the Idaho side of the divide. Lolo Pass, made famous in the journey of Lewis and Clark, bears the Indian name of tumsumelī (no salmon). However, the Flathead used to go south to the Snake and Salmon Rivers in Idaho for the salmon runs, often fishing in cooperation with Shoshones, Banacks, or Nez Percé. Women and children, as well as men, took part in catching the fish with weirs, traps, hooks, spears, and even clubs. Salmon usually were dried on racks and then packed in parfleches lined with wild mint.

Of the indigenous fish, dolly varden and cutthroat trout were favored most for food. Rattlesnake Creek, which flows into the Clark Fork River at Missoula, is called n·se'ai' for the dolly varden found there. These trout were caught with a baited hook and a line of woven horsehair, or snagged with bone hooks. Ellen Big Sam demonstrated how the bone hooks were manufactured from the scapula of deer. This thin, flat bone, when fresh, was fractured easily and the slivers fashioned into a barbed point, which was then fastened with sinews to a straight piece of bone or to a small stick.

Suckers and large minnows were utilized also. Fishing for them took place at any time of the year. Squawfish and chub, both large minnows, were among the commonest and most easily caught. Like suckers, they were fried until crisp, as they are very bony. One means of cooking them in the past was to clean them and run a pointed willow into the mouth and posteriorly through the flesh of the back by the tail.Two or three fish could be skewered on a single stick and roasted over a fire. Fish that were caught locally were seldom preserved by drying or pounded into pemmican.

Two species of fish, the American grayling (*Thymallus signifer*) and the burbot (*Lota lota*), common in the upper Missouri River but not found in the Bitterroot, were shown to the principal informant. She had never seen or heard of them. When the Flathead were in the Missouri River country, they were intent on hunting and avoiding their enemies and undoubtedly did little if any fishing.

Eastern brook trout, yellow perch, largemouth black bass, and pumpkinseed were recognized by the Indians as transplanted and are known by the inclusive term sinpūqit'tqu, translated as "thrown in."

With a few minor omissions, the fish shown to the informant represent all kinds that are to be found in the drainage of the Bitterroot, Flathead, and Clark Fork Rivers—the streams that flow through the homeland of the Flathead Indians. They included introduced as well as native species. As with the other lists of vertebrate animals, the fish are grouped in Table 1 according to their systematic arrangement rather than alphabetically. The scientific and common English names are those approved by the Committee on Common and Scientific Names of Fishes (Trans. Amer. Fish. Soc., 1945, pp. 355–384).

AMPHIBIANS AND REPTILES

There are relatively few species of amphibians in the Rocky Mountain area, and what there are, are not numerous. Only on rare occasions, when starvation was imminent, were they used for food. The different species of frogs were not recognized, but they were distinguished from the toads. As the English translation of the Flathead name for tadpoles is "young frog," the Indians must have realized that tadpoles metamorphosed into the adult form and were not another kind of animal. In many respects the Indians were farther advanced in their knowledge of zoology than Europeans of two centuries ago.

The only reptile eaten was the turtle, which

was roasted in pits. Turtle eggs also were considered a delicacy. The reptiles listed below (Table 2) are common throughout the area, except the rattlesnake, which is more or less restricted to the upper part of the Bitterroot Valley.

BIRDS

The Flathead ate all the birds and their eggs, but, with the flesh of large mammals as plentiful as it was, birds were not seriously hunted. In particular, Franklin's grouse was taken fairly often, mostly because this "fool hen" can be procured simply by hitting it with a stick. Boys and squaws would sometimes set snares for sharp-tailed grouse; and snow buntings and waxwings, which come into the country in large flocks early in winter, were shot and trapped for food. Magpie eggs were probably taken more frequently than eggs of any other bird. The magpie's large nests are constructed in low trees and brush, and so they are conspicuous and easily accessible. Some effort was made to obtain eagles and large hawks for wing bones, from which medicine flutes were made, and for feathers. Ellen confirmed Turney-High's statement (1937, p. 113) on the method of capturing eagles. The hunter dug a camouflaged pit and placed a bait of guts on the edge of it. When an eagle lighted on the bait, it was grabbed with the hands. An eagle hunter always took several sweat baths before hiding in the pit, making it less likely that his body odor would betray his presence. Pileated woodpeckers were sought for an unusual purpose. The bill of this bird was considered to be efficacious for relieving toothache. It was ground to a powder and packed in tooth cavities.

TABLE 1.—FLATHEAD INDIAN NAMES OF FISHES

Scientific classification	English name	Flathead name	Remarks
Pisces	Fish in general	sawé'ūs	
Oncorhynchus nerka	Red salmon	sūmslī	
Salmo clarkii	Cut-throat trout	eskᵘaikᵘaisūe	The term refers to the "black" color their backs have in water when viewed from above.
Salvelinus malma	Dolly varden:		
	small	se'ai'	
	large	ai'	
Salvelinus fontinalis	Eastern brook trout	sinpūqit'tqᵘ	Called "thrown in" because they are planted.
Prosopium williamsoni	Mountain white fish	xoyu	Translated "puckered lips."
Catostomus catostomus	Longnose sucker	} ċe'lēnē	
Catostomus macrocheilus	Columbia largescaled sucker		
Ptychocheilus oregonense	Columbia squawfish	k'ōqūē	
Mylocheilus caurinum	Columbia River chub	cit'laus	
Rhinichthys cataractae	Longnose dace	} clū'wē	The term is used for small fish in general.
Richardsonius balteatus	Redside shiner		
Ameiurus melas	Black bullhead	ūpūpūtsī	The name "whiskers" refers to the barbels.
Perca flavescens	Yellow perch	} sinpūqit'tqᵘ	See brook trout above.
Micropterus salmoides	Largemouth black bass		
Lepomis gibbosus	Pumpkinseed		
Cottus cognatus	Slimy muddler	s'tit'ma	

TABLE 2.—FLATHEAD INDIAN NAMES OF AMPHIBIANS AND REPTILES

Scientific classification	English name	Flathead name	English equivalent
Amphibia:			
Rana pipiens	Leopard frog	} slumslame	
Rana pretiosa	Spotted frog		
Frog larva	Tadpole	slxūlt'slumslame	Young frog
Bufo boreas	Toad	senaqᵘeqᵘa	
Ambystoma macrodactylum	Long-toed salamander	silslłę̄	
Reptilia:			
Ophidia	Snakes	sleċ̄ēwile'	
Thamnophis elegans	} Gartersnake	qᵘai'sleċ̄ēwile'	Black snake
Thamnophis ordinatus			
Pituophis catenifer	Gopher snake	sōlċ̄'nū	
Crotalus viridis	Rattlesnake	ḳ'lai'olexᵘ	
Chrysemys picta	Painted turtle	spel'qᵘa	

TABLE 3.—FLATHEAD INDIAN NAMES OF BIRDS

Scientific classification	English name	Flathead name	Remarks
Gavia immer	Loon	ûsolus	
Aechmorphorus occidentalis	Western grebe	ste'luksin	
Ardea herodias	Great blue heron	semalq^{u}ê	So named because its throat is rounded like a hill.
Botaurus lentiginosus	American bittern	x'awɪtô^{u}	
Cygnus columbianus	Whistling swan	s'pak'amɪ	The term is referable to "something white."
Anatidae (in part)	Geese in general	k^{u}esix'ô	
Chen hyperborea	Snow goose	wa'ô	Named for the sound they make.
Branta canadensis	Canada goose	t^{c}petap^{a}	The informant was not sure this was the goose to which the term applied.
Branta sp.	Domestic white goose	spa'k'amɪ	See swan above.
Anatidae (in part)	Ducks in general	sestlexum	The informant was unable to differentiate the mallard, baldpate, green-winged teal, pintail, or shoveller.
Mergus merganser	American merganser	sxaxai	
Cathartes aura	Turkey vulture		Not recognized.
Meleagris gallopavo	Domestic turkey	n'slet'slata	
Accipiteriidae	Hawks in general	stelstelstamu	The term means, "it grabs."
	Small hawks	s'kakanô	
Astur atricapillus	Goshawk	s'k'ak'ai	
Buteo borealis	Red-tailed hawk		This is one of the commonest hawks in the area, but it was not recognized.
Aquila chrysaetos	Golden eagle	mlekanu	
	Old dark golden eagle	skaiɪmɪ	
Haliaeetus leucocephalus	Bald eagle	p^{c}kaltkai	The name means "white head."
Circus hudsonius	Marsh hawk	k'ak'alstse	
Pandion haliaetus	Osprey	stex'ux'u	
Falco peregrinus	Duck hawk	xa'tot	
Falco sparverius	Sparrow hawk	c'lea	
Dendragapus obscurus	Blue grouse	ka	
Bonasa umbellus	Ruffed grouse	sq^{u}ɪsq^{u}is	Term also used for domestic chickens.
Pediocetes phasianellus	Sharp-tailed grouse	s'k'a	
Phasianus colchicus	Ring-necked pheasant	čusue'sq^{u}ɪsq^{u}is	Translated as "Chinamen's chicken."
Fulica americana	American coot	lɪ'dle	Name derived from the noise they make.
Numenius americanus	Long-billed curlew	wat'tluwit	The cry of the curlew sounds like its Indian name.
Oxyechus vociferus	Killdeer	stêcun	
Totanus melanoleucus	Greater yellowlegs	noexɪna	The name, "long nose" refers to this bird's long beak.
Larus californicus	California gull		
Zenaidura macroura	Mourning dove	xemɪ's'xem	The name is from the cooing sound the dove makes.
Bubo virginianus	Great horned owl	s'nɪne	
Nyctea nyctea	Snowy owl	n'spsinme	
Speotyto cunicularia	Burrowing owl	n'čečuwa	
Chordeilus minor	Nighthawk	s'spas	When the nighthawk dives through the air, its wing feathers make a vibratory noise. The term is derived from this sound.
Stellula calliope	Calliope hummingbird	l'ôwatnɪ	
Megaceryle alcyon	Belted kingfisher	tsalɪs	
Colaptes cafer	Red-shafted flicker	q^{u}elqele	Term is referable to "red wings."
Ceophloeus pileatus	Pileated woodpecker	spuwalqen	Term alludes to the beak and means "pick."
Asyndesmus lewis	Lewis's woodpecker	tsɪutsû	
Dryobates pubescens	Downy woodpecker	ctelxû	
Tyrannus verticalis	Arkansas kingbird	clečeča	
Riparia riparia	Bank swallow	clemo	The swallows are named "mud" for the material from which they construct their nests.
Hirundo erythrogaster	Barn swallow		
Cyanocitta stelleri	Steller's jay	q^{u}usq^{u}i	Term is derived from the dark color of the bird. The bluejay dancers are so named because they paint themselves dark. Evidently there is no connection between the medicine dance and the bird.
Pica pica	American magpie	aun	
Corvus corax	Raven	m'la	

TABLE 3.—(*Cont.*)

Scientific classification	English name	Flathead name	Remarks
Corvus brachyrhynchos	Crow	sca'a'	
Nucifraga columbiana	Clark's nutcracker	snalsqu	
Penthestes gambeli	Mountain chickadee	ctuskane	
Cinclus mexicanus	Dipper	k'axumēne	
Turdus migratorius	Robin	sk'lēxaxaĉ	
Sialia currucoides	Mountain bluebird	n'sqᵘilqᵘaᵘa	The term means "it's blue."
Regulus satrapa	Golden-crowned kinglet		Recognized, but no name recalled.
Bombycilla cedrorum	Cedar waxwing	kakusum	The waxwing's name means "star," perhaps for the yellow spot near the wing tip.
Vireo olivaceus	Red-eyed vireo	clqakutleaqᵘo	Same term used for other vireos, tanagers, and small yellow birds in general.
Passer domesticus	English sparrow	sūap'slue'wlū	Translated as "white man's bird."
Sturnella neglecta	Western meadowlark	wc'o'wl'	
Agelaius phoeniceus	Red-winged blackbird	clkaiclkiskla	Translated as "pinto blackbird."
Icterus bullocki	Bullock's oriole	wō'ō'xō	
Piranga ludoviciana	Western tanager	clqakutleaqᵘo	See Vireo above.
Hedymeles melanocephalus	Black-headed grosbeak		
Hesperiphona vespertina	Evening grosbeak	n'q'ᵘita'nak's	The Indian name means "big nose," allüding to the large beak.
Pinicola enucleator	Pine grosbeak		
Loxia curvirostra	Red crossbill	claiʻai'xosa	Translated "crossed nose."
Junco oreganus	Oregon junco		Common, but not recognized.
Melospiza melodia	Song sparrow	s'xlasasI	Term derived from the sound of its song.
Plectrophenax nivalis	Snow bunting	xslum'men'kum'kut	Name translated as "little snows."

According to the Indians, ducks, sharp-tailed grouse, and bitterns are much less numerous now than formerly. Also, they realize that the California gull, English sparrow, and Chinese pheasant are newcomers.

A checklist of the birds of western Montana compiled by the U. S. Forest Service (no date), contains 256 different species and subspecies. A great many of these are infrequent visitors to the state. Also, groups of them—especially the sparrows, warblers, and shorebirds—include numerous species that are difficult for even the avid birdwatcher to tell apart. Rather than include the whole list in this study, 70 of the most common and distinguishable birds were selected and exhibited to the informant. Their arrangement and nomenclature (Table 3) are adopted from the A.O.U. *Check-List of North American birds* (1931).

WILD MAMMALS

By far the greatest part of the Flathead's subsistence came from hunting large mammals. Although the narrow valleys in their own country had but few buffalo, there was an abundance of sheep, goat, elk, and deer which could support them. However, with the advent of the horse, it became more feasible to hunt the great herds of buffalo which grazed the plains on the other side of the Divide. In their seasonal quest for bison, the Flathead went at least as far east as the Lower Musselshell and Big Horn, and as far south as Fort Hall. (For further information on this subject and the methods used on the hunt, see Teit, 1930, pp. 344–348; Turney-High, 1937, pp. 112–123; and Ewers, 1948, p. 14.)

Smaller mammals had important, though often overlooked, values. For instance, the weasel was trapped in the winter for its white fur and tail, which were much esteemed for trimmings on dress. It is still one of the most popular adornments on Flathead fancy clothes. Porcupine quills also were favored for decoration on clothing. Only the longest and most even quills were chosen; the sharp ends were cut off; and then they were boiled. Before the introduction of commercial dyes, quills were frequently colored by adding yellow lichen (*Evernia barbata*) to the water. After boiling, the softened quills were flattened by drawing them through the fingers. They were sewn in a zigzag fashion, held fast at each angle with sinews. Usually, two needles were used in sewing. It was a more arduous process than decorating with beads.

Small mammals were also a source of food. Rabbits were caught in snares for this purpose by children, and ground squirrels and marmots were hunted frequently. The last two, when baked or barbecued, were considered excellent eating. In preparation, the hair was first burnt off; next, they were gutted; and then the legs, which were

cut off close to the body, were sewn inside the coelomic cavity. Badgers were eaten sometimes, but the more numerous red squirrels seem to have received little attention.

In his checklist of the recent mammals of Montana, Wright (1951, pp. 47–50) includes 137 species and subspecies; 73 of these are thought to occur west of the Continental Divide. Most of the genera in the list have a number of species and subspecies which are so much alike that only a qualified mammalogist can separate them. As examples, there are 10 different chipmunks (genus *Tamias*) and 9 different pocket gophers (genus *Thomomys*). A test with a series of various chipmunk species showed that the Indians did not differentiate the mammals by obscure distinctions like cranial characters or coat color, such as used by systematists. Consequently, only 50 kinds of mammals were selected for identification—one chipmunk, one pocket gopher, etc.—but they are believed to be representative of all the mammals in Flathead country (Table 4).

DOMESTIC MAMMALS

The Flathead had comparatively large herds of horses, which were notably superior in stamina and quickness to most Indian cayuses. Traders came from the Emigrant Road in the 1850's to barter for these fine animals. One, Van Etten, came all the way from Salt Lake City to procure horses for the Pony Express, an organization that required the best. The Blackfeet, as well as white traders, coveted these horses and made frequent raids to steal them. A Blackfoot brave told Governor Stevens that he "stole the first Flathead horse he came across—it was sure to be a good one" (Rep. Explor. etc., 1855, vol. 1, p. 148; Woody, 1896, p. 97; Hamilton, 1900, p. 48; Stuart, 1925, vol. 1, p. 169). The Flathead used to castrate their horses before the coming of white men, even with flint knives; and they knew that if gelded after maturity the horse would retain more of the vigor of the stallion.

Some of the first herds of cattle in Montana were possessed by Flathead. They procured most of them from men who traded for worn-out stock along the Oregon Trail late in the 1840's and who wintered the animals in the relative safety of Flathead country. This animal husbandry was encouraged by the Jesuit missionaries at St. Marys in the Bitterroot Valley, and later at St. Ignatius, Flathead Valley (Rep. Explor. etc., 1855, vol. 1, p. 323; Stuart, 1925, vol. 2, p. 97; Owen, 1927, numerous short references). It is evident from Table 5 that terms referring to cattle are derived from those used for buffalo.

The place of the dog in Flathead culture has been dealt with by Turney-High (1937, pp. 104–105). Ellen agreed that they did not use dogs for food as so many of the plains tribes did.

VERTEBRATE ANATOMY

Because they frequently dressed and prepared game, Flathead are naturally thoroughly familiar with vertebrate anatomy. They utilized practically all the carcass. Of the viscera, only the gall and urinary bladders were not eaten. Of course, sweetbreads, kidney, and liver were used; but besides, fat in the mesenteries was extracted for use in cooking; fat deposited around the kidney was considered a special dainty; brains served for food but were saved mostly for softening hides; and not only were the stomach and intestines devoured, but their contents were also. When the animal was reduced to a skeleton, the bones were not wasted, but were cracked to yield marrow (sᵊtos), and were mashed and boiled to make a broth. The greasy part of the broth which was skimmed off is called stčeɬamosɬ.

Ellen related an interesting use of one of the bones. Flathead sharpers manufactured stick game bones from the humerus of man. They believed that if the human humerus were used, it would numb the hand of the opponent, and betray which held the bone. Should the opponent suspicion such treachery, he could wash his hands in water containing the petals of wild roses, which allowed him to handle the bone with impunity.

Some terms given in Table 6—such as thumb, wrist, and arm—are used also to designate the bones in that portion of the body. Rather than repeat them, they are listed only with the skeletal terms.

INVERTEBRATES

Unlike some tribes in arid regions to the south, the Flathead do not seem to have considered any of the invertebrates as food. The reason is clear. None of the invertebrates occurred in great abundance in western Montana, and the more edible plants and game animals were generally plentiful enough for their needs. This lack of reliance on invertebrates as a food source is reflected in the relatively poor acquaintance, compared with the vertebrates, that the Flathead have with insects, worms, and molluscs.

TABLE 4.—FLATHEAD INDIAN NAMES OF MAMMALS

Scientific classification	English name	Flathead name	Remarks
Sorex cinereus	Long-tailed shrew		This small nocturnal animal was not recognized.
Myotis lucifugus	Little brown bat	t'elt'elue	
Ursus americanus	Black bear	unslamk'ai	
Ursus horribilis	Grizzly bear	sūmk'ai	
Martes pennanti	Fisher		This mammal is scarce in the area. It was not recognized.
Martes americana	Marten	tlō'lo	
Mustela frenata	Long-tailed weasel:		
	white pellage	x'la'pa	
	dark pellage	cl'ĕī	
Mustela vison	Mink	sča'xalē	
Gulo luscus	Wolverine		Rare this far south. Not recognized.
Mephitis mephitis	Striped skunk	x'a'stē^{u}	
Taxidea taxus	Badger	sī'xoi'xō	
Lutra canadensis	Otter	ltkū	
Vulpes fulva	Red fox	wa'wa'a	
Canis latrans	Coyote	sinčēlē	
Canis lupus	Timber wolf	n'tsīutsen	
Felis concolor	Couger	s'squ^{e}tesumuye	
Lynx canadensis	Canada lynx	senk'asu	
Lynx rufus	Bobcat	senk'asu	
Marmota flaviventer	Golden-mantled marmot	senctesa	
Citellus columbianus	Columbian ground squirrel	sī'sč	
Citellus lateralis	Golden mantled ground squirrel	salī	
Citellus tridecemlineatus	Thirteen-lined ground squirrel	salī	
Cynomys ludovicianus	Black-tailed prairie dog	cleku	Not present on west side of Divide in Montana.
Tamias amoenus	Western chipmunk	k^{u}k^{u}sčawē	
Tamiasciurus hudsonicus	Red squirrel	isčē	
Glaucomys sabrinus	Flying squirrel	sxo'pope	
Thomomys talpoides	Pocket gopher	pōlče	
Castor canadensis	Beaver	skulēu	
Dipodomys ordii	Kangaroo rat		Not recognized. It occurs only east of the Rockies.
Peromyscus maniculatus	White-footed mouse	q^{u}eukutene	
Neotoma cinerea	Bush-tailed wood rat	xē'ot	
Microtis pennsylvanicus	Meadow mouse	stumxoinī	
Ondatra zibethica	Muskrat	čečelexo	
Zapus princeps	Jumping mouse		Not recognized.
Mus musculus	House mouse	q^{u}eukutene	This introduced species is given the same name as the white-footed mouse.
Erethizon dorsatum	Porcupine	sq^{u}el'a	
Ochotona princeps	Rocky Mountain pika	s'čīne	
Lepus americanus	Snowshoe rabbit	cl'q^{u}a	
Lepus townsendii	Jack rabbit	cl'q^{u}a	
Sylvilagus nuttallii	Cottontail	wīusele'ačen	
Cervus candensis	Wapiti:		
	general term	tsētča	
	cow	sene	
	bull	tsēčōsene	
Odocoilus virginianus	White-tailed deer:		
	doe	sta'ō	
	buck	swatle	
Odocoileus hemionus	Rocky Mountain mule deer:		
	doe	stoltse	The same term is used for domestic mules.
	buck	pōwe	
	fawn	spalpī	
	fawn in fall	sleq^{u}kūēlt^{e}	
Alces americana	American moose	saselkes	

TABLE 4.—(*Cont.*)

Scientific Classification	English name	Flathead Name	Remarks
Rangifer montanus	Mountain caribou	stłelc'st^{e}	Caribou did not range as far south as Flathead country, but the neighboring Kalispel undoubtedly hunted them.
Antilocapra americana	American pronghorn	ste'an	Occasional pronghorns were possibly found on the west side of the Continental Divide.
Bison bison	American bison: general term	q^{u}oilq^{u}ai	Translated as 'black mass.''
	bull	q^{u}oilq^{u}aistolslem	
	cow	q^{u}oilq^{u}aiste'ma	
	calf	q^{u}oilq^{u}aitsclq^{u}elq^{u}ele	
	yearling	slq^{u}oik^{o}k^{o}	
Ovis canadensis	Bighorn	cla'ōmene	
Oreamnos americanus	Mountain goat	clō'tlē	

TABLE 5.—FLATHEAD INDIAN NAMES OF DOMESTIC MAMMALS

English name	Flathead Name	English name	Flathead name
Dog:		Colors of horses:	
general term	q^{u}asamī	apaloosa	čela'elxū
male	sk'altamīxuq^{u}asamī	bay	q^{u}el
bitch	clamōq^{u}asamī	black	q^{u}ai
pup	s'sltłtč	brown	čelče'e
Horse:		buckskin	čelpu
general term	sinčelsaska	gray	čaxai
stallion	n'melmelq^{u}e	palamino	čepī
gelding	sk'altemxoska	pinto	k'ai'e
mare	samō	smoky	čelpa
filly	s'lamōskl'akai'ī	Cow	ste'ma
colt	sk'altamīxuk'akai'ī	Bull	stolslem
yearling	cl'kēkōme	Calf	tsclq^{u}elq^{u}ele
race horse	sinskoikōsinsčelsaska		

Only the commonly occurring invertebrates were displayed for the informant. In the list below (Table 7), the arthropods are classified just to order, as this is about the level of recognition that the Indians have for them. It is true that the Flathead identify more insects than this list indicates, but they designate most of them merely by adfixing the color of the animal, or large or small, to its general term—like red ant, black ant, and so on. The table is arranged according to the alphabetical sequence of the English names.

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TABLE 6.—FLATHEAD INDIAN ANATOMICAL TERMS

English term	Flathead term	English term	Flathead term
External anatomy:		Skull	spelkainičpa
Back of any animal	senčemēčes	Tail (caudal vertebrae)	susps
Beak of bird or nose of mammal	sunpesa	Thigh (femur)	stōčēln?
Calloses	senolxawēčensen	Toes (phalanges)	stōčēln
Chest of any animal	s·ččawaočē	Vertebrae	asxap·m
Claws of bird or mammal	k'olk'ni	neural spine	c·llčen
Ear of mammal or operculum of fish	tene	Wrist (carpals)	sq^{u}alčumsene
Elbow	s·čumwōsaxum	Internal anatomy:	
Eye	s·čuq^{u}elu	Afterbirth (placenta)	senumxumwxel
Feather	skapu	Anus	senpōten
Fins of fish:		Blood	senxule
anal	tu'oc	Blood vessel	k'ak'alxum
dorsal	sinčlečen	Brain	sapenk'ai·n
paired	tō'tis	Caecum	salenē
Hair	spum	Diaphragm	estwep
Head	sp'elki·n	Gall bladder	q^{u}allŋ
Hide	k'ett	Greater omentum	sētq^{u}e
Hip and thigh region	stumst·e	Heart	spu'us
Knee	sčumkai'sene	Intestine, large	spalekai
Leg	sččemakasčes	Intestine, small	stxenē
Mandible of mammal or lower beak of bird	g^{u}lep^{o}	Kidney	m·tas
Pads on feet of dog, etc.	steces	fat surrounding kidney	olŋxosł
Scales of fish	čēmēces	Liver	pe'nlnē
Shoulder	senčumk'ai	Lungs	spe'upuxa
Tail of fish, bird, or mammal	susps	Mesentery, other than omentum	sēosu
Teats	sk'ai'em	Nostril	senla
Toes	ctesčls	Pancreas	xellp^{o}?
Wing	čuwaxunska'pu	Rectum	spōōū
Skeletal system:		Soul	senčemēčenaxus
Ankle (tarsals)	sg'elčumslčen	Spleen	xellp^{o}
Arm (including humerus, radius, ulna)	sčawaxun	Stomach	o·lln
Breast bone (sternum)	sk'ēpemln	abomasum of ruminate	sk'ai'etle
Collar bone (clavicle)	ntclelk'ai	rumen of ruminate	c·xaip^{o}
Finger (phalanges):		Teeth	x'alewxo
in general	saq^{u}amen	sharp teeth as canines	wicxenx'alewx^{o}
little finger	sta'ōtekai	bridle teeth of elk	senk'axuml
middle finger	saq^{u}amenesl'nq^{u}ō	Tendon	tlnē
ring finger	staōtkaislnq^{u}ō	Throat or esophagus	sk'almelten
thumb	sčulčst	Tongue	tlxuce
Heel (tarsals)	sčmelčen	Trachea	c'apelk'altlet^{o}
Knee cap (patella)	čenkaiečen	Urinary bladder	sentečlta
Pelvis (innominate)	t·kaleme	Urine	tč'e
Ribs	sxōx'tlp	Uterus	senswō'sewxelten
Shank (tibia and fibula)	sččmakečen	Vulva	t·čēl
Skeleton	spa'estso		

TABLE 7.—FLATHEAD INDIAN NAMES OF INVERTEBRATES

Scientific classification	English name	Flathead name	Remarks
PLATYHELMINTHES:			
Sp.	Tapeworm	senxa'seme	Translated as "breeding inside."
MOLLUSCA:			
Margaritana margaritifera	Clam	skōqᵘilane	
Sp.	Cowry	ta'mlō	Procured by trade from coast Indians and used to decorate the dress.
Helisoma trivolvis	Snail	ta'mlō	Translated as "sucking on something."
Lymnea stagnalis	Snail		
ANNELIDA:			
Sp.	Earthworm	čttequqanē	The term means "bait." It is used for fish-bait other than earthworms.
Placobdella parasitica	Leech	ta'mlō	Identical word used for snail.
ARTHROPODA:			
Hymenoptera	Ant	sxwōwɪ	
Hymenoptera	Bee	skol'wɪ	
Coleoptera	Beetle	ta'so'oe	Word used for small clicking beetles (family Elateridae).
	Larva of wood beetle	slwɪ'ēlqᵘa	
Lepidoptera	Butterfly	kᵘel'lōdlexᵒ	
	Caterpillar	ēlflaqᵘate	
Trichoptera	Caddis-fly larva	tc'čanēanpɪ	The aquatic larvae of the caddis-fly construct portable cases of sand or vegetable debris. The Indian name translated as "bound on the outside" refers to this case.
Decopoda	Crayfish		Not recognized.
Orthoptera	Cricket	salsl	
Odonata	Dragonfly	x'awatekaine	The word is used for insects with two pairs of large flight wings.
Diptera	Fly	xelmalten	
	white maggot	xelmalten	As the maggot has the same name as the fly, it was evidently realized that the larvae metamorphosed into flies.
	black maggot in meat	tētēslu	
Orthoptera	Grasshopper	ttace	
	Hive of wasps	skolslesxᵘ	
Lepidoptera	Moth	čqᵘeqᵘe'ene	
Diptera	Mosquito	se'lakus	
Araneida	Spider	sče'lt	
	large spider	two'pn'	
Plecoptera	Stonefly	sta'kančen	
Hemiptera	Water strider	stetōōme	
Acarina	Wood tick	ččstelčen	Translated as "horns lying down," and has its origin from a legend in which the tick loses a set of horns it once had.

PALEONTOLOGY.—*The type species of the gastropod genus* Protostylus. ROGER L. BATTEN, Geology Department, Columbia University. (Communicated by G. A. Cooper.)

In preparing the classification of Paleozoic gastropods for the *Treatise on invertebrate paleontology*, it was noticed that the type for the genus *Protostylus* has not been fixed. The genus was proposed by H. Mansuy in 1914[1] with two described species *P. lantenoisi* and *P. dussaulti*. The better illustrated and described species is *P. lantenoisi*, and it is hereby designated as the genotype species.

[1] Mansuy, H., *Nouvelle contribution à la paléontologie du Yunnan:* 1. Mémoires du Service Géologique de L'indochine, pp. 11–12, pl. 1, figs. 17 a, b, 18 a, b. 1914.

PALEONTOLOGY.—*Morphology of the test in the foraminiferal genus* Tristix *Macfadyen.* ALFRED R. LOEBLICH, JR., and HELEN TAPPAN, U. S. National Museum.

During the course of many years' work on the Mesozoic Foraminifera in America, the writers have encountered numerous specimens of the genus *Tristix* Macfadyen. In almost every occurrence, both in America and elsewhere, the species of this genus are accompanied by specimens like the form described as *Quadratina* by ten Dam (1946, p. 65). Although in the past the writers have differentiated these two morphological types, *Tristix* being triangular in section and *Quadratina* quadrate in cross section, the evidence now seems to indicate definitely that they are congeneric, and the name *Quadratina* ten Dam should be suppressed as a junior synonym of *Trixtix* Macfadyen.

Duplication of species.—In any large series of *Tristix*, selected from a single sample there are invariably a few quadrate forms that can be associated with the typical specimens by a similarity in all other characters. Macfadyen (1941, p. 55) in describing the genus *Tristix* also noted that some "species" were quadrangular in section instead of triangular, and stated that these "may possibly be found to be congeneric." A study of the occurrence of described species of *Quadratina* shows that almost invariably they are associated with very closely similar species of *Tristix*, and probably one or the other of the specific names should be placed in synonomy. An example of this is shown by four Jurassic species described by the writers (1950, p. 52) from the western interior of the United States and here shown in Figs. 1–4. These specimens were originally referred to *Tristix alcima* Loeblich and Tappan (Fig. 1) and *Quadratina inornata* Loeblich and Tappan (Fig. 2), but they are similar in being comparatively large, robust and with rounded angles, and large circular apertures. The latter name is here placed in synonymy. Another pair of "species" from the same beds were *Tristix reesidei* Loeblich and Tappan (Fig. 3) and *Quadratina juncta* Loeblich and Tappan (Fig. 4), the "types" of both similarly being smaller than the preceding form, more sharply angled and with more deeply excavated sides. The last name here is also placed in synonymy. An example from the Lower Cretaceous is described later in this paper, under *Tristix quadrata* (Vieaux).

There are numerous other instances that could be cited from the American Lower Cretaceous, but a complete list of synonymies will be given by the writers in their forthcoming monograph; hence is not discussed here. A similar duplication of species can be shown for most other occurrences of *Quadratina*, as they seem always to be associated with triangular forms of close affinity.

Evidence from "freaks."—It has been often observed that occasional "monstrous" specimens may be of value in determining relationships of foraminiferal genera. Examples are specimens of *Gaudryina*, with an occasional terminal chamber showing a tendency toward *Gaudryinella* (Tappan, 1943, p. 489), and *Citharinella*, which develops a third angle, showing a relationship with *Tribrachia* (Loeblich and Tappan, 1941, p. 19). We have also in our Lower Cretaceous collections specimens of *Citharina* with an occasional equitant chamber showing a development toward *Frondicularia*, a *Lenticulina* that develops a long series of globular uniserial chambers like *Nodosaria*, *Flabellammina* developing into *Frankeina*, *Gümbelina* developing into *Rectogümbelina*, *Textularia* with a central terminal chamber or two suggesting a relationship with *Bigenerina* and many similar examples.

In the large quantity of Lower Cretaceous material examined by the writers there have been found a few such monstrosities which show some bearing on the relationships of the forms now under discussion. A specimen from the Glen Rose formation (Fig. 7) is a typical *Tristix* in its early stages, but at about the midpoint of its development it became suddenly quadrate, so that it is a *Tristix* for half of its life span and a "*Quadratina*" in its later life history. A record of a similar occurrence of a "mixed" form is found in Berthelin (1880, p. 47). He recorded *Rhabdogonium acutangulum* Reuss from the French Albian, stating:

My specimens have chambers a little less serrated than the type, and tend to approach *R. maertensi* Reuss; but do not have a quadrangular section.

The triangular shells are in general somewhat more numerous than the quadrangular; but the character is not an absolutely constant one. I possess a specimen of an upper Jurassic species, which shows an abrupt passage without any transition from one to the other form. (Free translation.)

From this description Berthelin apparently had a specimen similar to the "mixed" form of Fig. 7. Obviously a single specimen cannot change its generic identity midway in its growth, and these freaks thus show a definite relationship between these "genera." Another freak in our Lower Cretaceous collection (although not here illustrated) is a *Lingulina* in its early stage, and becomes triangular in the later development. These two examples would seem to definitely indicate that *Lingulina*, *Tristix* and *"Quadratina"* should at least be placed in the same family, with *Lingulina* probably ancestral to *Tristix*.

A specimen that shows an even more interesting development is shown in Fig. 8. This is a twinned specimen which developed chambers simultaneously in opposite directions from the proloculus, one series of chambers being triangular in section (Fig. 8c) and the opposite extremity being quadrate in section (Fig. 8b). This specimen shows no transition from one genus to another but apparently it belonged to the two "genera" simultaneously and therefore supplies additional evidence that *Tristix* and *Quadratina* are synonymous, the number of angles being variable as are the number of ribs in a *Nodosaria*, etc.

Character of the aperture.—The aperture of *Tristix* presents several problems. It varies from a simple rounded one to triradiate or radiate. The genotype species of *Tristix*, *Rhabdogonium liasinum* Berthelin, has a circular aperture. Our Jurassic species also have only simple apertures (Loeblich and Tappan, 1950 a, b) as do the majority of the Lower Cretaceous species (Tappan, 1940, 1943). An occasional species which has deeply excavated sides may show a triradiate aperture, as does *Tristix excavata* (Reuss) as shown by van Voorthuysen (1947), and as can be seen on certain of our Lower Cretaceous specimens. This reaches a climax in such forms as *Triplasia temirica* Dain, 1934, which has a radiate aperture. It is possible that forms with definite radiate apertures should be excluded from this genus, but because of the fact that numerous genera of the Lagenidae may have either rounded or radiate apertures and as no specimens of this Russian Jurassic species have been available to the writers for examination, the radiate aperture is not here considered sufficiently important to warrant separation of this species.

"Quadratina" shows a similar variation in apertural characters. The genotype species, *Quadratina depressula* ten Dam, was described as having a radiate aperture. Other described species have simple rounded apertures. These quadrate forms are always less frequent than the triangular ones, however, hence as great a variation is not to be expected, because of the more limited number of available specimens.

Van Voorthuysen (1947, p. 44) figured a short internal tube in *Tristix excavata* Reuss from the Albian of Holland, but these could only be observed in young specimens with delicate and hollow tests. The writers have not been able to demonstrate an internal tube in the abundant specimens from the Comanchean strata (Albian) of Texas, but this may in part be due to the type of preservation and more probably, these short delicate internal tubes may have been resorbed by the organism.

Relationship of Tristix *and* Dentalinopsis. —In general *Tristix* is strongly triangular in section and *Dentalinopsis* Reuss is rounded in cross section, with three faint longitudinal keels. However, some species of *Tristix* closely approach the generic characters of *Dentalinopsis* and they seem to be closely related. This is especially true of some of the quadrate species such as *Dentalinopsis subquadrata* Tappan, 1940, which has very poorly developed angles and *Quadratina euthemon* Loeblich and Tappan which is nearly circular in section, with four faint longitudinal keels. It is possible that these species should be placed in *Dentalinopsis*, because of the lack of angularity and if so, this genus also would vary from triangular to quadrangular, presenting another character in common with *Tristix* and *Dental-*

inopsis and suggesting some relationship between them.

It is interesting to note, however, that these two genera are placed in separate families by various authors. Cushman (1948, p. 261) places *Dentalinopsis* in the family Buliminidae and derives it from the series *Angulogerina–Trifarina–Dentalinopsis* by acceleration of the uniserial stage, and *Tristix* was placed in the Lagenidae. Galloway (1933, p. 372) places *Dentalinopsis* in the family Uvigerinidae and also derives it from *Trifarina* by acceleration of the uniserial stage. Galloway notes that *Dentalinopsis* may have had some other ancestry as such uniserial forms are produced in many lines of evolution and also noted that *Dentalinopsis* occurs much earlier in the geologic column than does *Trifarina*, which was not mentioned by Cushman. Van Voorthuysen (1947, p. 45) also derives *Dentalinopsis* from *Trifarina* and has the line *Tristix–Entosolenia* [=*Oolina*] derived from an offshoot of the line *Trifarina–Dentalinopsis*. The derivation of *Oolina* (*Entosolenia* of van Voorthuysen) from *Tristix* is untenable in the writers' opinion, as we strongly doubt that unilocular forms are invariably the evolutionary end members, derived from multilocular ancestors, although this has been often stated in the literature. *Oolina* occurs as low stratigraphically as the Albian in Texas and the Upper Lias of Switzerland and if earlier records of *Lagena* were critically examined it may be found that some true *Oolina* occurred in earlier strata.

The presence of the internal tube in *Tristix* has led to its being placed by van Voorthuysen in the family Buliminidae, but it seems more difficult to see why *Dentalinopsis*, which appears so closely related to the Lagenidae, and incidentally to *Tristix*, is placed in the Buliminidae, for no internal tube has been demonstrated in *Dentalinopsis*. At the present time, the writers are uncertain as to what value in classification should be placed on these internal tubes. Parr (1947, p. 128) has included *Oolina* (*Entosolenia*), *Fissurina*, and *Parafissurina* in the family Lagenidae although all possess clearly defined internal tubes. Some other lagenids, such as *Lingulina falcata* Heron-Allen and Earland, possess internal tubes. *Glandulina glans* d'Orbigny of the Polymorphinidae has been demonstrated to possess an internal tube by Selli (1947, pl. 3) and *G. laevigata* d'Orbigny also has been shown to have this identical structure by van Voorthuysen (1950, p. 37). These tubes have been observed by the present writers in *Glandulina* from as far back as the Eocene.

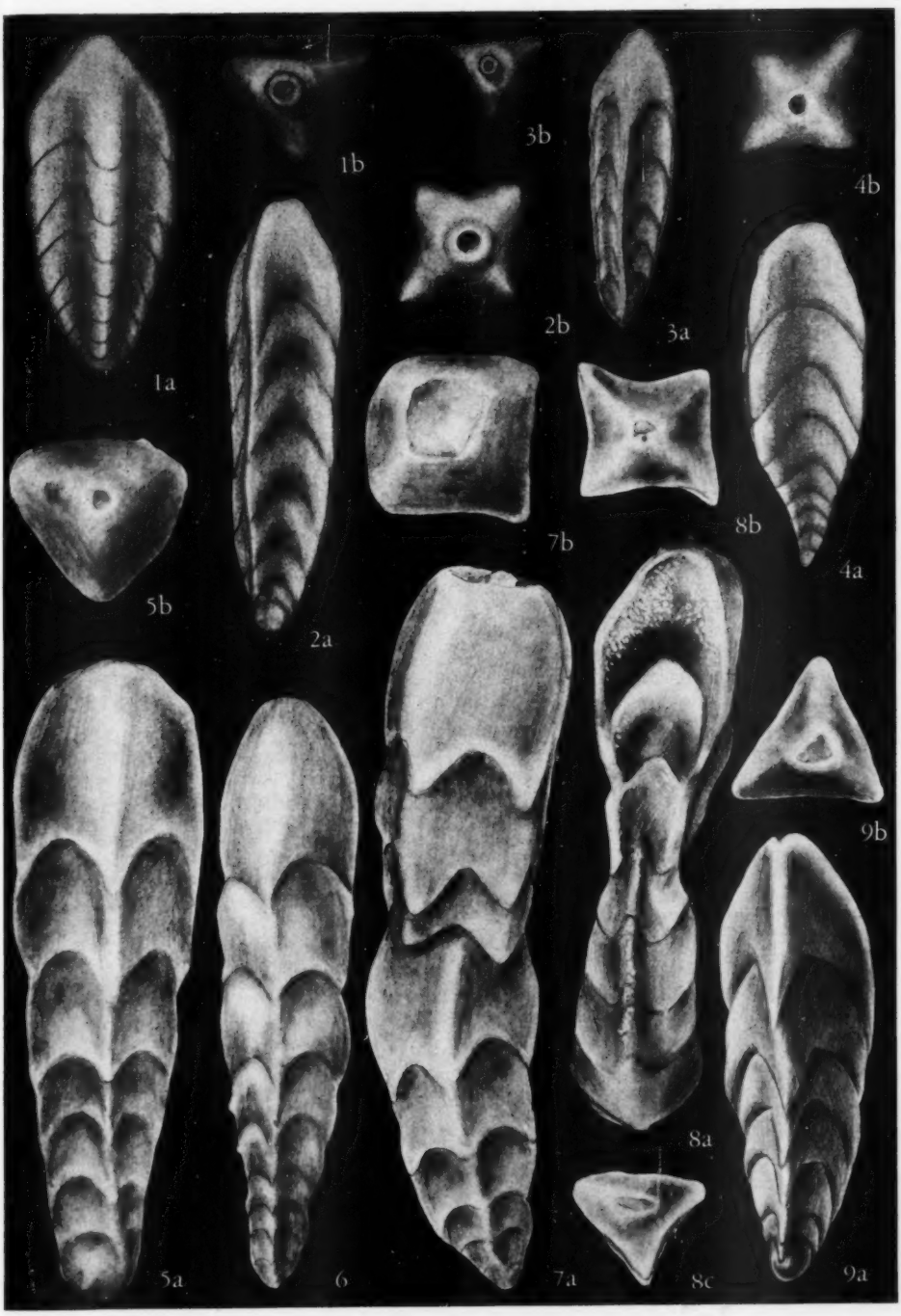
FIGS. 1a–2b.—*Tristix alcima* Loeblich and Tappan: 1a, Side view of triangular holotype (USNM 105007); 1b, top view, showing subacute angles and rounded aperture; 2a, side view of quadrate form (USNM 105013) originally described and named as *Quadratina inornata* Loeblich and Tappan; 2b, top view, showing quadrate section, subacute angles, and rounded aperture. All × 95 and both specimens from the Redwater shale member of the Sundance formation (Oxfordian) of South Dakota.

FIGS. 3a–4b.—*Tristix reesidei* Loeblich and Tappan: 3a, Side view of holotype (USNM 105009) showing arched sutures, acute angles, and pointed base; 3b, top view, showing triangular section, acute angles, and rounded aperture × 95; 4a, side view of quadrate form (USNM 105017) showing pointed base and moderately excavated sides (this form was originally described as *Quadratina juncta* Loeblich and Tappan); 4b, top view, showing quadrate section and rounded aperture. All × 158 and both specimens from the Redwater shale member of the Sundance formation (Oxfordian) of South Dakota.

FIGS. 5a–7b.—*Tristix comalensis* Loeblich and Tappan, n.sp.: 5a, Side view of holotype (USNM P. 842) showing arched sutures, triangular form with little excavation of the sides; 5b, top view showing triangular form with rounded angles and rounded aperture; 6, side view of paratype (USNM P. 843a) showing more slender form than that of the holotype; 7a, side view of paratype (USNM P. 843b) showing form with early *Tristix*-stage and later stages developing a quadrate section ("*Quadratina*" stage) thus producing a "mixed" form; 7b, top view showing quadrate outline of late chambers of the "mixed" form. All × 150 and all from the Glen Rose formation, Trinity group, Lower Cretaceous of Comal County, Tex.

FIGS. 8a–9b.—*Tristix quadrata* (Vieaux): 8a, Side view of twinned hypotype (USNM P. 845) with the quadrate half oriented at the top of the figure and the lower half exhibiting the triangular section, both parts arising from the same proloculus; 8b, top view of "*Quadratina*" half showing rounded aperture and slightly excavated sides; 8c, top view of *Tristix* portion of the twin showing elongate aperture (from the Kiamichi formation, Fredericksburg group, Lower Cretaceous, of Tarrant County, Tex.); 9a, side view of typical triangular hypotype (USNM P. 846) showing rounded proloculus and arched sutures; 9b, top view showing rounded aperture and sides with little excavation (from the Kiamichi formation, Fredericksburg group, Lower Cretaceous, of Johnston County, Okla.). All × 150.

All illustrations are shaded camera-ludica drawings. Figs. 1–4 by Helen Tappan Loeblich; Figs. 5–9 by Sally D. Lee, scientific illustrator, Smithsonian Institution.



FIGS. 1–9. (See opposite page for legend).

Other members of the Polymorphinidae such as *Polymorphina williamsoni* Heron-Allen and Earland, *P. acuta* Roemer and *P. soria* Reuss also have well-defined internal tubes. In addition the writers have in preparation the description of a Recent fauna in which many of the Polymorphinidae have internal tubes. It seems that this character appears in widely divergent families in the Foraminifera and may be considerably more prevalent than is noted in the literature. The writers hesitate to remove from the Polymorphinidae the species that possess internal tubes, until the whole group is studied in detail, and it seems best to consider both *Dentalinopsis* and *Tristix* as members of the family Lagenidae, closely related to each other and to *Lingulina*, and although all three appear early in the history of the family, the last two appear to be somewhat specialized in that at least some of their species possess well-defined internal tubes.

With the above considerations in view concerning the form of the test the writers consider it advisable to suppress the name *Quadratina* as a junior synonym of *Tristix* and to revise the generic description of *Tristix* so as to include quadrate as well as triangular forms.

Genus **Tristix** Macfadyen, 1941

Tristix Macfadyen, Phil. Trans. Roy. Soc. London, ser. B, biol. sci., no. 576, **231**: 54. 1941.
Tricarinella ten Dam and Schijfsma. C. R. Somm. Soc. Geol. France, no. 16: 233. 1945.
Quadratina ten Dam, Bull. Soc. Géol. France, ser. 5, **16**: 65. 1946.
Dentalinopsis Reuss (part, of authors)
Rhabdogonium Reuss (part, of authors)
Triplasia Reuss (part, of authors)

Emended diagnosis.—Test free, uniserial, generally triangular in section, but occasionally quadrate; wall calcareous, hyaline; aperture terminal, rounded to radiate, with an internal tube in at least some species.

Tristix comalensis Loeblich and Tappan, n. sp
Figs. 5–7

Test free, narrow elongate, slightly tapering, sides nearly flat, angles broadly rounded; chambers up to 9 in number, increasing gradually in height as added, final chamber of approximately equal height and breadth; usually triangular in section, and infrequently quadrate; sutures distinct, slightly depressed, gently arched at the center of each face of the test, curving gently downward to the angles of the test; wall calcareous, hyaline, surface unornamented; aperture terminal, rounded.

Length of holotype (Fig. 5), 0.65 mm; greatest breadth, 0.18 mm; length of paratype of Fig. 6, 0.60 mm; breadth, 0.15 mm. Length of paratype of Fig. 7, 0.73 mm. Other specimens range from 0.26 to 0.99 mm in length.

Remarks.—This species differs from *T. quadrata* (Vieaux) in being larger and broader with higher chambers and less strongly arched sutures, more rounded angles and less excavated sides.

Types and occurrence.—Holotype (USNM P. 842) and paratypes of Figs. 6, 7 (USNM P. 843a–b) and unfigured paratypes (USNM P. 844a–v) all from the Glen Rose formation (Trinity group), Lower Cretaceous, from 520 feet below the top of the formation, in a road cut on the east side of U. S. Highway 281, 2.4 miles north of the junction with Texas Highway 46, in Comal County, Tex.; collected by A. R. Loeblich, Jr., 1949.

Tristix quadrata (Vieaux)

Dentilinopsis excavata (Reuss) Plummer (not *Rhabdogonium excavatum* Reuss, 1862), Univ. Texas Bull. 3101: 187, pl. 9, figs. 11–12. 1931.
Dentalinopsis excavata (Reuss) Tappan, Journ. Pal. **14** (2): 118, pl. 18, figs. 10 a–b. 1940.
Dentalinopsis mărtensi (Reuss) Tappan (not *Rhabdogonium mărtensi* Reuss, 1863), Journ. Pal. **14** (2): 119, pl. 18, figs. 11 a–c. 1940; Journ. Pal. **17** (5): p. 509, pl. 81, figs. 23 a–b. 1943.
Dentalinopsis quadrata Vieaux, Journ. Pal. **15** (6): 626, pl. 85, figs. 8 a–b. 1941.
Tristix acutangula (Reuss) Loeblich and Tappan (not *Rhabdogonium acutangulum* Reuss, 1863), Woodbine Symposium, Southern Methodist Univ., Fondren Sci. Ser. no. 4: 88, pl. 2, figs. 17–18. 1951.

Test free, small, narrow, parallel-sided; consisting of a rectilinear series of about 3 to 9 chambers, increasing gradually in height as added and either triangular or quadrangular in section, with angles fairly sharp and sides moderately excavated; sutures distinct, slightly depressed, strongly arched on the faces, extending sharply downward at the angles; wall calcareous, hyaline; aperture terminal, rounded.

Length from 0.3 to about 0.7 mm, breadth of a face 0.13 to 0.18 mm.

Remarks.—This species has been referred to various European species in the past, but the European species are distinct. *Rhabdogonium excavatum* Reuss is a much larger species, with flaring rather than parallel sides and with much more deeply excavated faces. *R. märtensi* Reuss is a quadrangular form with sharper angles and more excavated sides and is much larger (the type being 1.15 mm in length) and more flaring. *R. acutangulum* Reuss differs in being larger, with much lower chambers, which are only very slightly arched centrally.

The only available name proposed for the present species is *Dentalinopsis quadrata* Vieaux. This specific name was proposed for the quadrate forms, but must be applied to the entire species, even though it is actually descriptive of only a small percentage of the specimens, the majority being triangular in section.

The holotype of Vieaux was stated to be in the University of Oklahoma collections, but Vieaux's types have never been received at that institution and are thus not available for comparison. However, the present writers were on the collecting trip with Vieaux when his samples were obtained, and a duplicate set of all samples is in our collection. These samples have supplied many specimens of both the triangular forms, which Vieaux referred in his faunal list to *Dentalinopsis excavata* (Reuss), and the quadrangular forms on which he based his species *D. quadrata*. The specimens referred by Tappan (1943, p. 509) to *D. quadrata* are a distinct species, a much larger form than the present species, and with more excavated sides.

Types and occurrence.—Holotype (in Vieaux collection) from the Denton formation of north Texas.

Hypotype of Fig. 8 (USNM P. 845) from the Kiamichi formation, from a 5-foot section of brown marl, 11 feet above the base of the exposure in a deep road cut on the Stove Foundry Road, just north of the new Texas and Pacific Railroad shops, in Fort Worth, Tarrant County, Tex. Collected by A. R. Loeblich, Jr., and Helen Tappan Loeblich, 1941.

Hypotype of Fig. 9 (USNM P. 846) from the Kiamichi formation, from a 4.2-foot section of dark blue-gray clay shale with sandy seams, in a zone of abundant *Gryphea navia* 3 feet above the base of the exposure and 15 feet below the base of the Duck Creek, in a deep roadside ditch on the south side of the road in the SE¼, sec. 10, T. 5 S., R. 7 E., 1 mile east of Bee, Johnston County, Okla. Collected by W. E. Ham, of the Oklahoma Geological Survey, and A. R. Loeblich, Jr., 1946.

Other published records figure this species from the Del Rio clay of central Texas, the Grayson and Duck Creek formations of northern Texas and southern Oklahoma, and the Maness formation (subsurface) of east Texas. It thus ranges from the Kiamichi formation (Fredericksburg) through the Maness formation (uppermost Washita).

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PALEONTOLOGY.—*A rare Tertiary glycymerid from South Carolina and Florida.*

DAVID NICOL, U. S. National Museum.

F. S. MacNeil, of the U. S. Geological Survey, several months ago showed me some specimens of an unusual glycymerid which had been collected from a water well near Miami, Fla. Recently I examined the specimens more closely and decided that they are not *Glycymeris quinquerugata*, as they had been labeled, but are *Pectunculus transversus* Tuomey and Holmes from Smith's Goose Creek, S. C. Although the description given by Tuomey and Holmes is brief, the salient characters mentioned by them (the great length and the wrinkled posterior side) are significant enough to identify the specimens in the Museum as the same species. Unfortunately, *Pectunculus transversus* Tuomey and Holmes, 1856, is a homonym of *Pectunculus transversus* Lamarck, 1819, and Tuomey and Holmes's species is herein renamed.

Glycymeris aberrans Nicol, n. name
Figs. 1–5

Pectunculus transversus Tuomey and Holmes, Pleiocene fossils of South-Carolina: 51, pl. 17, fig. 6c. 1856; not *Pectunculus transversus* Lamarck, Animaux sans vertèbres 6 (pt. 1): 55. 1819.

Description.—The following is the origina description by Tuomey and Holmes:

> Shell ovate transverse, equilateral; anal side on the interior wrinkled; pallial margin finely crenulated.
>
> This specimen, although a cast, is so very characteristic that it cannot be confounded with any other species. The length is nearly twice the breadth, and the teeth are closer on the anal than on the buccal ridge of the hinge.

With the additional material at hand, the following can be added to the original description: Beaks orthogyrate, located at the middle of the dorsal border; ligament small and low, made up of three or four chevrons, amphidetic; dorsal border long and straight, ventral margin broadly arched; teeth located on a broad arch, 20 to 25 in number, the larger ones grooved in the middle; crenulations on interior margin numerous, narrow, closely spaced, eight per cm on the midventral border of a specimen 27 mm in height; central part of shell has broad, slightly raised radial ribs, which disappear at both ends of the shell; no radial striae appear on the broad ribs, but the absence of striae may be due to poor preservation; radial threads present on the umbo and occasionally on the ends of the shell.

Most striking feature is rugae on outside of shell; rugae large and numerous, commonly reflected on interior margin of shell as small undulations, particularly on posterior and dorsal margins but in some specimens on anterior margin too; rugae best developed on umbo and at both ends of shell, middle of larger shells relatively free of them; rugae not parallel to growth lines and commonly split up by them.

Measurements in mm—

U. S. N. M. no.	*Height*	*Length*	*Convexity*
Hypotype 561486	26.8	33.6	19.3
Hypotype 561484	16.9	20.9	13.7

Comparisons.—The closest related species to *Glycymeris aberrans* is the rugate form of *G. americana* (Defrance). *G. aberrans* differs from it by being more elongate, by having well-developed rugae on both ends of the shell, and by not having well-developed striae on the broad radial ribs.

Localities.—This species was reported from Smith's Goose Creek, S. C., by Tuomey and Holmes. The locality is described in greater detail by Cooke (1936, p. 129) as follows:

> U. S. Geological Survey Loc. no. 10412. Bluff on southeast side of Goose Creek a third of a mile southeast of Seaboard Air Line Railway and three-fourths of a mile southeast of Melgrove (Berkeley County, South Carolina).

The specimens in the U. S. National Museum are from U. S. Geological Survey loc. no. 15112. From well G.—188, Krome Avenue and Tamiami Trail, 19 miles west of Miami, Dade County, Fla. (67.8 to 144.9 feet below the surface).

Geologic age.—Tuomey and Holmes called the Smith's Goose Creek locality Pliocene. Cooke (1936, p. 130) tentatively assigns the beds at Smith's Goose Creek to the Pliocene but says that they may be upper Miocene. Miss Julia Gardner identified the well material at the depths where *Glycymeris aberrans* was found as upper Miocene. The closest relative to *G. aberrans*, the rugate form of *G. americana*, is confined to upper Miocene strata.

Types and other specimens.—Hypotype U. S. N. M. no. 561484 and hypotype U. S. N. M. no.

561486 and 13 other specimens in U. S. N. M. Collection with nos. 561483, 561485, 561487, 561488, 561489.

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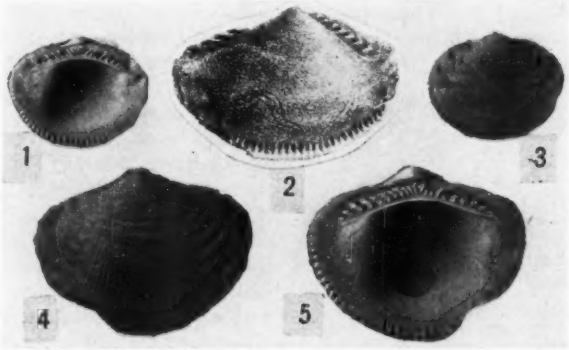

FIGS. 1–5.—*Glycymeris aberrans:* 1, Interior view and 3, exterior view, right valve, hypotype U. S N. M. no. 561484; 2, internal cast, copied from Tuomey and Holmes, 1856, pl. 17, fig. 6c; 4, exterior view and 5, interior view, right valve, hypotype U. S. N. M. no. 561486. All figures natural size. Hypotypes from U. S. G. S. loc. no. 15112, 19 miles west of Miami, Dade County, Fla. Tuomey and Holmes's specimen from U. S. G. S. loc. no. 10412, Smith's Goose Creek, Berkeley County, S. C.

ENTOMOLOGY.—*Notes on synonymy in Siphonaptera.* G. H. E. HOPKINS, British Museum (Natural History). (Communicated by C. F. W. Muesebeck.)

In the course of preparing a catalogue of of the N. C. Rothschild collection of fleas a few instances have come to light in which names currently accepted as referring to the same taxonomic unit actually apply to different units, and many more in which names believed to refer to separate units are synonyms. The volume dealing with the Pulicoidea is now in the press, and it is hoped that it will be published this year, but it seems desirable to put on record some of the other hitherto-unpublished instances in which the accepted placing of a taxonomic unit appears to be incorrect. Unless stated otherwise, all instances in which changes in the placing of species and subspecies are suggested are based on examination of specimens, commonly types or paratypes. With regard to genera, which are subjective units and not objective, there are two courses which can be adopted if two apparently natural groups of species differ by characters apparently of little phylogenetic significance, and the choice between them seems to be mainly a matter of convenience. Obviously a difference in phylogenetically important characters must be recognized by generic separation, but where this is not the case it seems to me to be better to emphasize the resemblances between the two groups than their differences unless considerations of convenience force one to snatch at any chance of breaking up an unwieldy group. Where, therefore, a small group has been broken up into subgenera on phylogenetically unimportant characters I can see little advantage in retaining this arrangement, whereas if the same thing has happened in a large group convenience dictates accepting it. This is, for instance, the case in the Rhadinopsyllinae, where I have grave doubts whether *Rhadinopsylla* and *Rectofrontia* are really generically separable or even whether they they are entirely natural groups, but have kept them separate because the group would otherwise be so inconveniently large.

Apart from instances of synonymy at-

tributed below to other workers who have kindly informed me about them, there are many other instances in which a particular synonymy has been suggested to me as probable by some other worker (especially G. P. Holland) and confirmed by me; I have not thought it necessary to make a specific acknowledgment in such instances, because the final responsibility for such synonymies is mine.

Family Coptopsyllidae

Neocoptopsylla Wagner, 1932 = *Coptopsylla* Jordan and Rothschild, 1908. Admittedly the type species, *N. wassilievi* Wagner, is a good deal more distinct from the other species than these are from one another, but its characteristics do not seem to merit generic rank and its retention as a subgenus would serve no particularly useful purpose in so small a group as *Coptopsylla*.

Coptopsylla lamellifer fallax Ioff and Tiflov, 1934 = *C. lamellifer ardua* Jordan and Rothschild, 1915. The fact that the latter name was based on males whose characteristics were altered by parasitic castration in no way affects its validity.

Family Vermipsyllidae

Arctopsylla Wagner, 1930, is extremely difficult to separate from *Chaetopsylla* Kohaut, 1903, because the two characters that have been used to define it (the permanent, instead of deciduous, frontal tubercle and the number of segments in the labial palp) do not always go together. Provisionally I accept it as a subgenus of *Chaetopsylla* and refer to it those species in which the frontal tubercle is permanent.

Pulex ursi Rothschild, 1902 = *Chaetopsylla (Arctopsylla) tuberculaticeps ursi* (Rothschild).

Vermipsylla strandi Wahlgren, 1903 = *Chaetopsylla (A.)t.tuberculaticeps* (Bezzi), 1890.

Family Leptopsyllidae

Ctenopsyllus fallax Rothschild, 1902 = *Peromyscopsylla silvatica fallax* (Rothschild).

Typhlopsylla spectabilis Rothschild, 1898 = *Peromyscopsylla silvatica spectabilis* (Rothschild).

Pectinoctenus adalis Jordan, 1929 = *Pectinoctenus pectiniceps* (Wagner), 1893.

Family Ischnopsyllidae

Ischnopsyllus noctilionis Costa Lima, 1920 (referred by Pinto, 1930, to *Hormopsylla*) belongs to neither of these genera but is almost certainly a *Ptilopsylla*. No specimens have been available, but Dr. Costa Lima has kindly provided photo-micrographs of the holotype.

Aptilopsylla carlsbadensis Ewing, 1940 = *Sternopsylla texana* (C. Fox), 1914 (information kindly supplied by Lt. Col. R. Traub).

Eptescopsylla I. Fox, 1940 = *Nycteridopsylla* Oudemans, 1906.

Nycteridopsylla eusarca major Rothschild, 1909 = *Nycteridopsylla eusarca* Dampf, 1908. In 1949 (Entomologist **82**: 134–136) I placed *eusarca* as a synonym of *Nycteridopsylla pungens* (Walckenaer), 1802, and I still think that this is probably correct. But there is a certain element of doubt in the matter and in any case Walckenaer's name has not been used (except on this one occasion) for very many years. I therefore intend to ask the International Commission on Zoological Nomenclature to suppress the name *Pulex pungens* Walckenaer, 1802, and pending their decision I intend to revert to calling the flea *N. eusarca* Dampf.

Myodopsylloides Augustson, 1941 = *Myodopsylla* Jordan and Rothschild, 1911.

Myodopsylla notialis Jordan, 1937 = *Myodopsylla wolffsohni wolffsohni* (Rothschild), 1903.

Ischnopsyllus liui Chao, 1947 = *Ischnopsyllus liae* Jordan, 1941.

Ischnopsyllus tateishii Sugimoto, 1933 = *Ischnopsyllus indicus* Jordan, 1931.

Ischnopsyllus ashworthii Waterston, 1913 = *Rhinolophopsylla ashworthi* (Waterston).

Ischnopsyllus ectopus Jordan, 1937 = *Rhinolophopsylla ectopa* (Jordan).

Family Hypsophthalmidae

Chiastopsylla numae klaveriana De Meillon, 1940 = *Chiastopsylla numae* (Rothschild), 1904.

Chiastopsylla caffrarica De Meillon, 1940, and *C. crassus* De Meillon, 1940 = *C. rossi* (Waterston), 1909 (information kindly supplied by Dr. De Meillon).

Chiastopsylla couchae De Meillon, 1940 = *C. godfreyi* Waterston, 1913.

Family Hystrichopsyllidae
Subfamily Hystrichopsyllinae

Pulex gigas Kirby, 1837, has been variously placed. Baker (1895) used the name for a species now referred to the Neopsyllinae; Rothschild (1915) thought it a *Stenoponia*; and Jordan (1929) considered it to be a *Hystrichopsylla*.

Baker's suggestion is certainly wrong, for the flea undoubtedly belongs to the Hystrichopsyllidae, but the description and figure are not good enough to make it possible to decide with any certainty whether it is a *Stenoponia* or a *Hystrichopsylla*, though the latter genus seems a little more likely than the former. The name should be discarded until topotypical specimens can be obtained.

Saphiopsylla Jordan, 1931 = *Atyphloceras* Jordan and Rothschild, 1915, but could be recognized as a subgenus if this would serve any particular purpose.

Atyphloceras artius Jordan, 1933, and *A. felix* Jordan, 1933 = *A. multidentatum* (C. Fox), 1909.

Subfamily Dinopsyllinae

Dinopsyllus lypusus Jordan and Rothschild, 1913 = *Dinopsyllus ellobius lypusus* Jordan and Rothschild.

Dinopsyllus tenax Jordan, 1930 = *D. longifrons tenax* Jordan.

Dinopsyllus semnus Jordan, 1937 = *D. hirsutus semnus* Jordan.

Subfamily Listropsyllinae

Ceratophyllus stygius Rothschild, 1908 = *Listropsylla dolosa* Rothschild, 1907.

Subfamily Rhadinopsyllinae

Corypsylloides Hubbard, 1940 = *Corypsylla* C. Fox, 1908. It could be accepted as a subgenus, principally on the presence of pseudosetae under the collar of the metanotum, but there is little object in recognizing subgenera in a genus containing only three known species.

Corypsylla setosifrons Stewart, 1940 = *Corypsylla ornata* C. Fox, 1908 (information kindly supplied by Dr. E. W. Jameson).

Nearctopsylla hygini laurentina Jordan and Rothschild, 1923 = *N. g. genalis* (Baker), 1904.

Rhadinopsylla s.g. *Rangulopsylla* Darskaya, 1949 = *Rectofrontia* Wagner, 1930.

Actenophthalmus C. Fox, 1925, is at most a subgenus of *Rectofrontia* Wagner, 1930, and is provisionally recognized in that grade.

Micropsylloides Ewing, 1938, is a subgenus of *Rectofrontia* Wagner, 1930.

Rhadinopsylla bureschi Jordan, 1929 = *Rectofrontia fraterna bureschi* (Jordan), *Rhadinopsylla casta* Jordan, 1928 = *Rectofrontia fraterna casta* (Jordan), and *Rhadinopsylla integella* Jordan and Rothschild, 1921 = *Rectofrontia fraterna integella* (Jordan and Rothschild). *Rhadinopsylla* (*Rectofrontia*) *integella concava* Ioff and Tiflov, 1946, and *R.*(*R.*)*integella pilosa* Ioff and Tiflov, 1946, of which specimens have not been available, are presumably also subspecies of *Rectofrontia fraterna* (Baker), 1895.

Micropsylla Dunn, 1923, is a subgenus of *Rectofrontia* Wagner, 1930.

Subfamily Anomiopsyllinae

Megarthroglossus procus oregonensis Hubbard, 1947 = *Megarthroglossus procus* Jordan and Rothschild, 1915.

Megarthroglossus divisus wallowensis Hubbard, 1947 = *Megarthroglossus divisus divisus* (Baker), 1898 (information kindly supplied by Lt. Col. Traub).

Anomiopsyllus congruens Stewart, 1940 = *Anomiopsyllus falsicalifornicus congruens* Stewart.

MYCOLOGY.—*On the fungus genera* Titaea, Monogrammia, *and* Araneomyces.

S. C. DAMON,[1] Quartermaster Depot, Philadelphia, Pa. (Communicated by G. W. Martin.)

While studying genera of staurosporous Moniliaceae, a striking similarity between *Monogrammia miconiae*, *Araneomyces acariferus*, and species of *Titaea* was noted. Investigation into all available information has led to the reduction of *Monogrammia* and *Araneomyces*, both monotypic genera, to the synonymy of *Titaea*, with the transfer of their species to that genus. In this connection, type material of *Titaea clarkeae* Ell. and Ev. (originally published as *T. clarkei*) has been re-examined, and it has been shown to be congeneric with other species assigned to the genus.

[1] I wish to express my appreciation to Dr. W. L. White, of the Farlow Herbarium, for the opportunity to study the type specimen of *Araneomyces acariferus*, and to Dr. Leland Shanor, of the University of Illinois, for his cooperation in searching for the type specimen of *Monogrammia miconiae* among the Stevens collections.

Titaea was erected for a staurosporous fungus growing parasitically, according to Saccardo (1876), on a species of *Dimerosporium*. In addition to the type species, *T. callispora*, four others had been added prior to the two recent papers by Hansford (1944, 1946), in which five more species were described. The four older species were treated with particular reference to the morphology of their conidia by Ingold (1942) in connection with his treatment of *Tetracladium*. Ingold agreed in part with the older opinion advanced by von Höhnel (1914) that *T. maxilliformis* Rostrup was so distinct from *T. callispora* as to warrant its removal from *Titaea*. Höhnel, accordingly, erected the genus *Maxillospora* for this species, but Ingold concluded from his studies on *Tetracladium marchalianum* that the two species were congeneric and transferred Rostrup's fungus to *Tetracladium*. At that time he characterized the genus not on an ecological basis, as had been done previously, but on the morphology of its spores, which, he said, had branches arising or diverging from a central axis as in *Titaea* but differing in having a single upwardly directed cell or process arising (at some distance from the central axis) from one of the branches. This extra-axial process is somewhat hard to determine in *Tetracladium setigerum* because of the difficulty in defining the central axis in that species. Furthermore, the different morphology of this process in the species of the genus is also somewhat confusing. It would seem that *Tetracladium* as an ecological genus could be distinguished from *Titaea* more easily than on its present morphological basis; but a conclusive discussion of this matter must await study of more forms than are presently available. With the exception of *T. marchalianum*, which has filiform processes like those of *T. clarkeae*, the spores of *Tetracladium* species have a somewhat cheiroid appearance, whereas the spores of *Titaea* have upwardly and downwardly, outwardly directed arms suggestive of no particular structure. Another feature of *Titaea* spores which separates them from those of *Tetracladium* is the fact that the central axis is 2-celled and forms an integral part of the spore, whereas in *Tetracladium* the central axis, though definable, sometimes lacks this distinctness. If these are the characteristics of *Titaea* and *Tetracladium* spores, it will be noted that there are no suitable distinctions between those of *Titaea* and *Monogrammia* or *Araneomyces*. Unfortunately, *Monogrammia miconiae* is known only from its original description and illustration (reproduced in Fig. 1, A) and was described by Stevens (1917) for a fungus occurring in association with *Hyalosphaeria miconiae* in Puerto Rico. *Araneomyces acariferus*, of which type material exists in the Höhnel collection in the Farlow Herbarium,[1] was based upon (1909) a fungus found on stromata of *Rosellinia miconiae*. The spores of this fungus are illustrated in Fig. 1, B. From the spores of both *A. acariferus* and *M. miconiae* it is obvious that they are only specifically different from other species of *Titaea*. Furthermore, both occur on foliicolous ascomycetes in tropical regions, as do almost all other species of *Titaea*; and though it is possible that future studies will provide evidence by which *Titaea* may be divided into more homogeneous groups it is felt that *Araneomyces* and *Monogrammia* should be merged under the

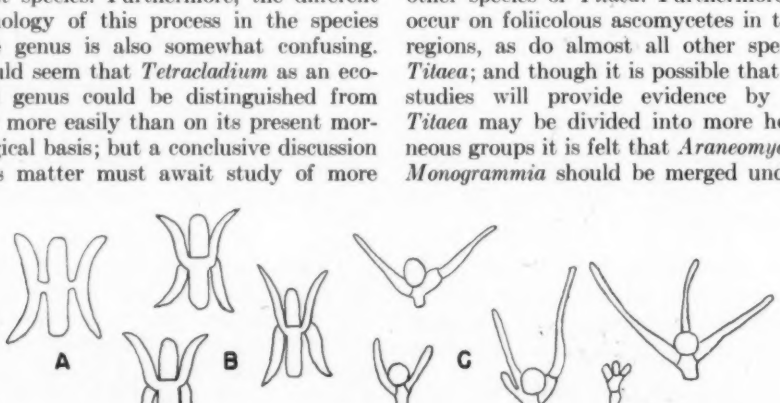

FIG. 1.—A, Spore of *Monogrammia miconiae* redrawn from Stevens (1917); B, spores of *Araneomyces acariferus* drawn from type material (× 1,000); C, spores of *Titaea clarkeae* drawn from type material (× 750) (reduced approximately ⅓).

older name. Although there is a striking similarity between the spores of both species, there can be no evaluation of this because of the lack of material of *M. miconiae*, and it is felt that they should both be maintained as valid species of *Titaea*. The following two new combinations are therefore proposed:

Titaea acarifera (von Höhnel) comb. nov.
Araneomyces acariferus von Höhnel, Sitzb. Akad. Wiss. Wien **118:** 894, illus. 1909.

Titaea miconiae (Stevens) comb. nov.
Monogrammia miconiae Stevens, Trans. Illinois Acad. Sci. **10:** 202, illus. 1917.

Although well described by Ellis and Everhart (1891), *Titaea clarkeae* Ell. and Ev. is discussed here because it has been found that some specimens under this label in the North American Fungi, no. 2466, have material of hyphomycetes other than *T. clarkeae* present; and because Ingold (1942) remarked upon the lack of spore illustrations upon which to base a judgment of the species. *T. clarkeae*, though not foliicolous, is found in association with a species of *Dichaena* and possesses spores (Fig. 1, C) most like those of *T. doidgeae* Hansford in that the branches are long and filiform, but differing from that species in other details. It possesses the 2-celled axis typical of *Titaea* of which the upper cell is globose as in the spores of *T. toddaliae*, and *T. ugandae*.

It is felt that this is a typical species of *Titaea*, and, so far as is known, it is the only species of the genus occurring in continental North America.

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PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

ANTHROPOLOGICAL SOCIETY

The Anthropological Society of Washington held its annual business meeting on January 14, 1952, and elected the following officers: President, WALDO R. WEDEL (reelected); Vice-President, GEORGE M. FOSTER, JR. (reelected); Secretary, WILLIAM H. GILBERT, JR. (reelected); Treasurer, MARGARET C. BLAKER (reelected); Councilors to the Board of Managers, JOHN C. EWERS (reelected), JOHN A. JONES, MARK H. WATKINS (reelected), GEORGE TRAGER (reelected), MARIAN L. VANDERBILT (reelected), and SIDNEY ADAMS (reelected); Representative to the Washington Academy of Sciences, WALDO R. WEDEL (reelected).

A report of the membership and activities of the Society since the last annual meeting follows. The total membership totaled 98, an increase of 8 over a year ago. Thirteen new members were elected during the year as follows: HARRY W. BASEHART; Dr. DIETHER VON DEN STEINEN; Dr. JOHN ALAN JONES; Mrs. LILIAN FULLER JONES; CHARLES H. FAIRBANKS; JEAN HUSSEY, Mrs. MAURY H. TRAVIS; Rev. C. M. LEWIS; Mrs. MARGARET C. GILBERT; Dr. HAROLD HENRY PLOUGH; Mrs. EDITH CROWELL TRAGER; Dr. MARIAN W. SMITH; and RALPH KEPLER LEWIS.

Death of two members during the year was reported: Dr. ANTONIO GOUBAUD-CARRERA, Ambassador from Guatemala to the United States, on March 9, 1951, and Mrs. ALICE L. L. FERGUSON, artist, archeologist, and writer, on June 7, 1951.

The report of the Treasurer for the year ended December 31, 1951, follows:

Credit:		
Balance forwarded	$1,634.11	
Withdrawn, Perpetual Building Association	1,986.50	
Sale of U. S. Savings Bond, Series G	486.50	
Dues collected	135.00	
Dividends, Investment Co. of America	50.60	
Year-end dividend, Investment Co. of America	61.60	
Dividends, Washington Sanitary Housing Co.	18.00	
Dividends, Massachusetts Investor's Trust	92.00	
Cash balance from capital gain dividend, Massachusetts Investor's Trust	19.41	
Total		$4,483.72
Debit:		
Purchase of securities	$3,251.10	
Deposited in Perpetual Building Association	486.50	
AAA dues paid for Secretary, Treasurer, and one life member	15.00	
Refund to AAA	1.00	
ASW share in Science Calendar	1.00	
Speakers	41.00	
Incidental meeting expenses	14.00	
Printing and mailing notices	95.05	
Florist's bill	10.20	
Treasurer's expenses (stamped envelopes and postage)	5.00	
Total		$3,919.85
Balance (in bank)		$ 563.87
Assets:		
Funds invested in Perpetual Building Association (with interest to Dec. 31, 1951)	$ 536.12	
4 shares Washington Sanitary Housing Co. (including stock dividend of 2 shares, Nov. 21, 1951) @ $100 per share	400.00	
110 shares Investment Co. of America @ $12.46 per share	1,370.60	
50 shares Massachusetts Investor's Trust @ $37.61 per share	1,880.50	
1 share Massachusetts Investor's Trust @ $35.59 per share	35.59	
Cash in bank	563.87	
Total as of Dec. 31, 1951		$4,786.68
Corrected Total* as of Dec. 31, 1950		4,334.11
Increase		452.57

* The report of 1950 erroneously showed a total of $5,674.96, an excess of $1,340.85. This amount, resulting from the sale of Washington Sanitary Improvement Co. stock, was listed as such, but was also included in the figure representing cash in bank.

Programs during the year were arranged by Dr. Eugene C. Worman, chairman of the program committee, and by the Secretary. All meetings were held at the U. S. National Museum. Speakers and the titles of papers presented before the Society in 1951 were as follows:

January 24, Dr. IRVING ROUSE, *Archeological excavations in Venezuela* (with motion pictures).

February 22, Dr. CLIFFORD EVANS, *Prehistory to history at the mouth of the Amazon River* (with slides).

March 20, Mrs. ELDEN E. BILLINGS, Mexico's musical Indians.

April 17, Dr. REGINA FLANNERY, Dr. WILLIAM N. FENTON, and Dr. WILLIAM H. GILBERT, *The Eastern Woodland Indians, then and now.*

May 15, Dr. GEORGE TRAGER, *Linguistic and ethnological history of the Southwest, some methodological considerations.*

October 16, Dr. DONALD N. WILBER, *Iran and Afghanistan, a challenge to the ethnologist* (with slides).

November 29, Dr. MARIAN W. SMITH, *The western heritage in Indian and Pakistani nationalism.*

Plans for perfecting and improving the Society's system of accounts were presented at the annual meeting on January 14, 1952. The President was authorized to appoint a planning committee to expand the activities of the Society in conjunction with the program committee. In November 1951 President Wedel extended an invitation in behalf of the Society to the American Anthropological Association to hold its annual meeting in 1953 at Washington, D. C.

WILLIAM H. GILBERT, *Secretary.*